

Claims

All prior listings of the claims are replaced by the following complete listing of the claims.

We claim:

1. (Currently amended) A slurry for chemical mechanical polishing (CMP), comprising:
a bulk solution including at least one additive selected from the group consisting of an oxidizer, a selective adsorption additive, and a salt, and;
a plurality of nanoporous comprising particles, wherein an average particle size of said nanoporous comprising particles is less than 500 nm, wherein said nanoporous particles comprise a core comprising a first material, wherein said first material is selected from the group consisting of silica, zirconia, yttria, titania, silicon nitride, silicon carbide, ceria oxide, manganese oxide and doped silica.
2. (Previously presented) The slurry of claim 1, wherein said additive comprises said selective adsorption additive.
3. (Previously presented) The slurry of claim 2, wherein said selective adsorption is in a concentration of from 6 to 1,000 critical micelle concentration (CMC) when said selective adsorption additive is non-ionic and from 1 to 1,000 CMC when said selective adsorption additive is zwitterionic, anionic or cationic, said selective adsorption additive self assembling in said bulk solution.
4. (Previously presented) The slurry of claim 1, wherein said selective adsorption additive comprises at least one cationic, anionic or zwitterionic surfactant, wherein a minimum concentration of said surfactant is 6 CMC.

5. (Cancelled)

6. (Previously presented) The slurry of claim 1, wherein said nanosize nanoporous particles comprise nanoporous cores coated with a solid material coating or first core material coated with a second material, said second material being a nanoporous coating.

7. (Cancelled)

8. (Previously presented) The slurry of claim 1, further comprising at least one of a species selected from the group consisting of a polyhalide ion, I₂, Br₂ and F₂.

9. (Cancelled)

10. (Previously presented) The slurry of claim 9, wherein said average particle size is from 200 to 500 nm.

11-16. (Cancelled)

17. (Previously presented) The slurry of claim 1, wherein a porosity of said nanoporous particles is in a range from 10 to 60 %.

18. (Cancelled)

19. (Previously presented) The slurry of claim 1, further comprising a passivating additive, wherein said passivating additive comprises at least one selected from the group consisting of benzotriazole (BTA), tolytriazole (TTA), imidazole, thiols, mercaptans, oxalic acid, sodium hexanoate and carboxylic acid.

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20. (Original) The slurry of claim 1, further comprising at least one complexing agent.

21. (Original) The slurry of claim 20, wherein said complexing agent comprises at least one selected from the group consisting of acetic acid, citric acid, tartaric acid and succinic acid.

22. (Previously presented) The slurry of claim 2, wherein said selective adsorption additive comprises a mixture of at least one anionic surfactant and at least one cationic or zwitterionic surfactant.

23. (Previously presented) The slurry of claim 2, wherein said selective adsorption additive comprises at least one surfactant selected from the group consisting of SAS, SDS, CTAB, and CTAC octylphenol ethylene oxide condensate, polyoxyethylene sorbitan monooleate, and a water soluble copolymer of an average molecular weight of approximately 15,000 consisting of alpha-olefins and dicarboxylic acids, partially esterified with an ethoxylated alcohol.

24. (Currently amended) The slurry of claim 2, wherein said selective adsorption additive comprises CTAB or CTAC, and said nanoporous comprising particle comprises silica.

25. (Original) The slurry of claim 24, wherein said CTAB comprises C₁₂TAB.

26. (Previously presented) The slurry of claim 25, wherein said oxidizer is selected from the group consisting of hydrogen peroxide, potassium ferrocyanide, potassium iodate, and perchlorates.

27 - 28. (Cancelled)

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29. (Previously presented) The slurry of claim 2, wherein said selective adsorption additive comprises at least one polymer.

30. (Original) The slurry of claim 29, wherein said polymer is at least one selected from the group consisting of polyethylene oxide (PEO), polyacrylic acid (PAA), polyacryamide (PAM), polyvinylalcohol (PVA) and polyalkylamine (PAH).

31. (Cancelled).

32. (Previously presented) The slurry of claim 1, wherein said salt is at least one selected from the group consisting of chlorides, nitrates and ammonium-based salts.

33. (Original) The slurry of claim 1, wherein a pH of said slurry is from 6 to 13.

34. (Original) The slurry of claim 1, wherein a pH of said slurry is from 8 to 11.

35. (Previously presented) The slurry of claim 1, wherein a concentration of said composite particles in said slurry is from approximately 1% to 40% by weight.

36. Cancelled.

37. (Previously presented) The slurry of claim 1, wherein said oxidizer is at least one selected from the group consisting of hydrogen peroxide, potassium ferrocyanide, potassium iodate and perchlorates.

38-71. (Cancelled)

72. (Previously presented) The slurry of claim 1, wherein a pH of said slurry is from 1 to 6.

73. (Currently amended) A slurry for chemical mechanical polishing (CMP), comprising:

a bulk solution, said bulk solution being in a pH range of 1 to 6 or 8 to 13, and a plurality of nanoporous ~~comprising~~ particles, an average particle size of said nanoporous comprising particles is less than 500 nm, wherein said nanoporous particles comprise a core comprising a first material, wherein said first material is selected from the group consisting of silica, zirconia, yttria, titania, silicon nitride, silicon carbide, ceria oxide, manganese oxide and doped silica.

74. (Previously presented) The slurry of claim 73, further comprising at least one additive selected from the group consisting of an oxidizer, a selective adsorption additive, and a salt.

75-76. (Canceled)

77. (New) The slurry of claim 1, wherein the nanoporous particles further comprise a solid coating comprising a coating material selected from the group consisting of zirconia, alumina, titania, silicon nitride, silicon carbide, polymeric materials and their mixture.

78. (New) The slurry of claim 73, wherein the nanoporous particles further comprise a solid coating comprising a coating material selected from the group consisting of zirconia, alumina, titania, silicon nitride, silicon carbide, polymeric materials and their mixture.

79. (New) The slurry of claim 1, wherein the nanoporous comprising particles comprise pores ranging from 0.21 -30 nm.

80. (New) The slurry of claim 73, wherein the nanoporous comprising particles comprise pores ranging from 0.21 -30 nm.